



Steam/air heat exchanger QMAA



Installation, Operation and Maintenance Manual

Description

General

The heat exchanger consists of steel tubes with steel fins, hot-dip galvanized, in a single mechanical unit.

The heat exchanger heats air using the heat energy in supplied steam.

The steam is led through the tubes, where it condenses.

The fins on the outside of the tubes increases the surface area to enable a balanced heat transfer from steam to air.

Labelling

The name plate is located on the inlet side of the heat exchanger and provides information about:

- Manufacturer
- Order No.
- Year of manufacture
- Maximum working temperature (MWT)
- Maximum working pressure (MWP)
- Test pressure
- Dry weight
- Inner volume

Quality system

Coiltech AB is certified according to quality system standard ISO 9001 and environmental management standard ISO 14001.

Design

The coils of the heat exchanger consist of hot-dip galvanized tubes and fins.

The fins are in one piece, without slits, to prevent dust particles and fibres from getting trapped in the coils package. The manifold on the inlet side is fitted with a distribution plate, which uses choke holes to ensure an even distribution of steam to the tubes.

The casing is made of hot-dip galvanized steel plate and complies with the Class B tightness requirements according to Swedish Regulations VVS AMA 98. The manifold headers on the inlet (steam) and exit (condensate) sides are made of hot-dip galvanized steel plate.

Tubes:	Ø 19.0 x 1.5 mm DIN 17175 St 35.8/l
Fins:	Thickness 0.4 mm EN 10130 FeP01 Am
Manifolds:	Boiler plate SS 1432-31
Tube plate:	Boiler plate SS 1432-01
Frame:	Thickness 2 mm EN 10142 Fe P02G

Safety precautions and warnings

Handling and care

Read the entire manual before you begin to work with the product. All work on the heat exchanger must be carried out by trained personnel familiar with the product and the safety regulations.

Lifting

The dry weight of the heat exchanger is indicated on the name plate, which is located on the inlet side of the heat exchanger. Before you begin to lift the heat exchanger:

- Check that there is no visible damage to the lifting eyes.
- Check that appropriate lifting equipment is used, and that the size of the hooks is adapted to the lifting eyes.

Operating pressure

The steam temperature must not exceed the maximum working temperature (MWT, °C), and the heat exchanger may only be used in a system which has been approved for the maximum working pressure (MWP, MPa) indicated on the name plate.

Connections

The pipe couplings of the heat exchanger must not be forced to carry the dead weight of the external piping system. Also, they must be relieved of the expansion forces exerted by the piping system.

The connections must be protected against impacts, external loads and other mechanical stress.

Note: Mechanical loads and impacts may damage the manifold header.

Protection against freezing

Ensure that appropriate measures have been taken to prevent freezing, before commissioning the heat exchanger.

Cleaning

Only use cleaning agents that are environmentally acceptable and do not damage the coil.

High temperatures

When the heat exchanger is in operation, its' various parts may be hot. This includes manifolds and casing. The heated air leaving the coils may also be quite hot.

Caution

During the installation of coils that use steam as heating medium, caution must be applied when opening venting valves and closing valves in the system. There is risk for severe damage caused by pressure hammering or by escaping steam if valves are opened abruptly.

Coiltech AB takes no responsibility for the installation of heat exchangers in a heating system. Similarly, no responsibility is taken for damage caused by incorrect planning, installation or maintenance of such a system.

Installation

Transport

Check for any damage caused during transport or unloading. Parts more exposed to such damage are the fins, the lifting eyes and the manifolds.

Any transport damage noted must be reported immediately to the shipper and to Coiltech AB. Information about the damage should also be entered in the consignment note.

Mounting

The heat exchanger must be firmly secured.

The pipe couplings are fitted with welding studs DN32-100. To reduce loads on the fittings and the coils from the dead weight and the expansion forces of the external piping, all pipes should be secured as close to the heat exchanger as possible.

Adjustment and control

If several heat exchangers are connected in series and the temperature of the supplied air can be below freezing, the first heat exchanger in the series should be supplied with a full steam load. Any necessary adjustments must be made to the following units in the series. If the steam supply to the first unit is regulated, the risk of freezing is considerable.

Orientation

Heat exchangers air/steam are normally designed for a horizontal air flow. However, they may be oriented for a vertical air flow, provided the tubes slope towards the point of exit for the condensate.

Fittings and piping

The piping should slope in such a way that any condensate formed in the external steam pipes is drained and does not enter the coils. The condensate pipe must slope downwards, away from the coils.

All fittings mounted in the system must be designed for steam or condensate, respectively. The fittings must be dimensioned for the prevalent pressure, temperature and flow, and must be connected according to the manufacturer's instructions.

Piping for steam and condensate

Screens to catch contaminant particles such as scale and rust must be installed in the steam system.

Contaminants may clog the choke holes in the manifolds, or cause malfunction in the steam valves. The steam should be dry. Wet steam causes corrosion damage in the piping, and may cause hammering, which may in turn damage the coils or the fittings.

The steam pipes must be drained of condensate before entering the coils, using a shunt to bypass the coils and the fittings. The diverter should be fitted as close as possible to the coils, in a way that ensures separation of the steam from the condensate in the steam pipe.

If the condensate pipe ends at a level above that of the diverter, the heat exchanger will operate against a static pressure, proportional to the height of the column of liquid, plus the pressure loss (resistance) in the condensate diverter and any other fittings connected to the heat exchanger. Therefore, overhead condensate piping should be avoided. The steam and condensate pipes should be dimensioned according to the intended flows, not according to the dimensions of the connections. During storage of a spare or a removed heat exchanger, the fins must be protected to prevent personal injury or damage to the heat exchanger.

Steam purity

The pH value of the steam should be between 9,2 and 9,6. The amount of oxygen (O₂) contained in the steam must not exceed 0.01 mg/kg.

Dismounting

When removing the heat exchanger from the system, the coils must first be emptied of all liquid.

Note: Any liquids potentially harmful to the environment must be collected in suitable containers and sent for disposal or recycling.

The heat exchanger must not be lifted before it has been emptied of all liquid.

Maintenance and service

General

The heat exchanger should be inspected regularly to prevent operating troubles.

The following checks should be made:

- Mountings - make sure no load-carrying screws or threads are damaged.
 - Coils - make sure the fins and tubes are clean and intact.
- Also check that steam under pressure reaches the heat exchangers (the boiler must provide the required pressure and all valves must be open), and that condensate draining and venting are in operation throughout the system. One defective condensate diverter may influence all the others.

Cleaning

Even a very effective air filter will let some dust particles through. A coating of dust on heat-exchanging surfaces will hinder the passage of air and slow down the transfer of heat. Therefore, the coils must be kept clean, and any one of the following methods (or a combination of several) is appropriate:

- Cleaning with a jet of air.
- Cleaning with a jet of steam.
- Rinsing or flushing with water.

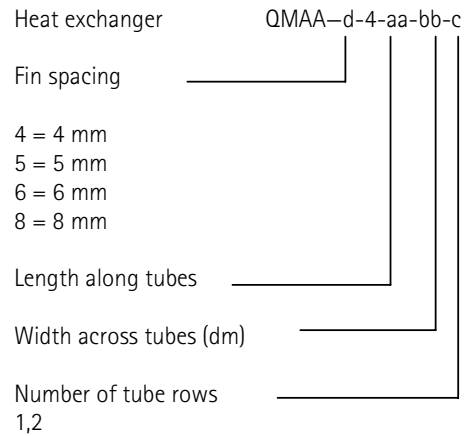
If surfaces are contaminated with fat or oil, first spray the entire heat exchanger with an environmentally acceptable solvent under low pressure. High-pressure clean with water after 10 - 12 minutes.

There must not remain any traces of solvent in the coils after cleaning, since that would cause new dust particles to stick to the surface. After cleaning, all removed dust must be collected before starting the fan.

Repair work

The warranty becomes void if parts and materials not recommended by Coilech AB are used.

Code key



Coiltech AB: SE-614 81 Söderköping
Phone +46 121-19100
Fax +46 121-10101
www.coiltech.com

Coiltech, Afrikalaan 303, BE-9000 Gent, Belgium
Phone +32 9 218 71 30
Fax +32 9 218 71 39



Head Office:
33050 POCENIA (UD) | Via Giulio Locatelli, 22
Phone +39 0432.772.001
Fax +39 0432.779.594
www.ecogroup.com
info@ecogroup.com